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TECHNOLOGY DEPT.

April 12, 1952

# SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE



Tree Frog Singing

See Page 233

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# Now! Record your own sound on 16 mm film!



New RCA Magnetic Recorder-Projector records sound on 16mm film, projects movies and reproduces either magnetic or optical sound track. Can also operate as tape recorder or public-address system.

## Another RCA First! Amazing new RCA recorder-projector

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- Erase mistakes and re-record

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## MEDICINE

# Use Skin for Cancer Test

Possible method of mass detection of dread disease in early stages foreseen by testing for changes in electrical resistance of skin.

► **FIRST STEPS** toward a skin test for detecting cancer have been taken by Dr. Curt P. Richter at Johns Hopkins Hospital and Medical School, Baltimore.

The test might become the long sought means of mass detection of early, unsuspected cancer in the population, but Dr. Richter says it is much too early to know about that. So far, he has used it mostly on cases of cancer that were well along. He is planning now for a trial on a large number of very early, suspected cancer cases.

Changes in electrical skin resistance will tell whether or not cancer is present in apparently healthy persons, if the test succeeds. Dr. Richter has already found very great changes in electrical skin resistance in patients known to have cancer of the lungs, stomach and breast.

To make the test, an electrode is fastened to the patient's ear. Another electrode on a roller wheel is run over the patient's skin while the doctor watches the galvanometer to see whether the skin's resistance to an electric current is higher or lower than normal.

In some cases Dr. Richter has studied the skin resistance was very high. These were cases of lung cancer in which the cancer was pressing on or had destroyed part of the sympathetic nervous system chain. The effect is the same as is seen when these nerves are cut surgically. The part of the skin supplied by them does not sweat and has very high electrical resistance.

So, in cancer testing by this method, if the roller electrode running over the patient's skin picks up an area of high resistance, it means pressure on or destruction of nerves supplying that area of skin. Since doctors know the path of nerves supplying various areas, they can tell where the pressure is and examine the patient further to see whether cancer or a non-cancerous tumor is causing it.

Very low electrical skin resistance, and sweating, will show up in areas where the cancer or tumor is causing pressure or destruction of certain other nerves. These are the ones operating the referred pain mechanism. By referred pain, doctors mean pain felt in the skin or at the surface of the body although the cause of it is located in one of the internal organs which may not even lie directly below the surface area that pains. Classic example is the pain of angina pectoris where the cause of the pain is in the heart but the pain is referred to and felt in the chest and a thin strip along the inner side of the upper arm.

Cancers of the digestive system might show up on the test by giving a low electrical skin resistance because the referred pain mechanism was affected. The referred pain mechanism is complicated and consequently the skin resistance test may not be practical for detecting all types of cancers.

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## MEDICINE

## Bathroom Sponge Grows Cancer Cells for Research

► **THE BATHROOM** sponge is now a tool for cancer research. Tiny slices of cellulose sponges are used for growing cancer cells outside the body.

This new technique, whereby cells can grow and change as they do inside the body, was announced at the National Cancer Institute by its inventor, Dr. Joseph Leighton, 30-year-old pathologist.

The sponge provides a sort of skeleton upon which the cells can grow and divide. In previous methods, when scientists put

cells into a culture, those cells multiplied, but the new cells were always like their parents. Now, with the sponge skeleton, new and different cells are formed from the first cells, just as in the human body.

By watching how the differences occur, scientists may get some clue as to how cancer cells, which are "different" from normal cells, develop.

The part of the body from which the cells were taken may now be discovered with this new method. Each organ in the body has its individual cell structure and the structure that grows in the sponge is therefore a clue. This may be useful when cancer from one organ has spread through the body and settled in other sites. Its structure will have the same characteristics as the place where the cancer originated.

Dr. Leighton also plans to put both normal and cancer cells from the same part of the body on the same sponge and watch the differences in their growth and division.

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## BIOCHEMISTRY

## Giant Molecules of Life Are Seen for First Time

► **SCIENTISTS HAVE** seen for the first time the giant chemical molecules that seem to play an important role in heredity and the changing of one disease into another.

Drs. John W. Rowen, Murray Eden and Herbert Kahler of the National Cancer In-



**SPONGE FOR CANCER CELLS**—The first step in the sponge method for tissue culture developed at the National Cancer Institute is pictured above. Using an ordinary razor blade, narrow strips are cut from the cellulose sponge. These are washed and sterilized before being placed in test tubes to receive implantations of tissue.



stitute, Bethesda, Md., announced to the American Chemical Society in Milwaukee that by the use of the electron microscope they had seen for the first time a single nucleic acid molecule.

This kind of macromolecule is found in large quantities in the hearts of living matter, particularly in the chromosomes and genes of all cells that carry on the biological stream of life.

These nucleic acid molecules are also the major constituents of viruses. The desoxyribose nucleic acid extracted from such bacteria as the pneumococci, staphylococci and colon bacillus has the extraordinary property of transforming one type of bacteria into another type. This transformation, known as mutation, takes place only when the nucleic acid molecule is present as a giant molecule.

The single molecule was found to be approximately one ten-millionth of an inch in diameter and approximately three 100-thousandths of an inch long.

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#### INVENTION

### Half Life Measurement Made More Accurately

► MEASURING THE half life of radioactive materials when the half life is as short as one-thousandth of a second can be accurately done with a new method which received a patent recently.

Clyde E. Wiegand, Oakland, Calif., is the inventor and he has assigned his patent, number 2,590,057, to the Atomic Energy Commission.

Previous methods, such as impressing the radioactive pulse of the material on an oscilloscope, were inefficient for the short-lived materials, the inventor says. The present method feeds the pulses from a radioactive detector through a discriminator and a height-varying circuit to a multichannel differential pulse discriminator.

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#### PSYCHOLOGY

## Frustration Is Killing

► FRUSTRATION can be killing.

Many a person, frustrated in a situation where he cannot release his pent-up feelings, has probably felt that this might be true. Now a scientist has shown that it is true, at least for mice. And the mouse studies, he believes, may provide a clue to some human breakdowns when there has been a cumulative effect of emotional inactivity, or frustration, on the patient's endurance.

The scientist is Dr. Peter Rabe of Jackson Memorial Laboratory, Bar Harbor, Me. The mice were frustrated by physical restraint. The greater the restraint, the greater was the frustration.

The mice were the kind that have convulsive seizures when exposed to the ringing of a bell. In Dr. Rabe's experiments, some of these mice were allowed to run freely in a large washtub while another group was penned in a small wire cage in the tub.

Ordinarily these mice begin to run when the bell starts to ring. Those in the wire cage did not have room to run. The animals free to run in the washtub showed only a 25% death rate. The animals unable to run because of confinement in the small cage showed an 85% death rate.

Dr. Rabe believes the prevention of the discharge of energy, inability to "work it off" when emotionally aroused by the ringing bell, made the difference because it caused a more violent frustration.

Dr. Rabe's findings with mice corroborate those of Dr. David Levy, New York child psychiatrist, that physical restraint and consequent frustration lead to abnormal behavior.

Dr. Rabe does not agree with the definition of frustration which says that frustration occurs when a desired object cannot be obtained. This, he says, is only a de-

scription of a situation which may lead to frustration. A better definition, in his opinion, is that frustration is a state of interruption or blockage in the organism's natural tendency toward tension adjustment, or toward keeping a balance between stimuli from the environment and reaction to the stimuli.

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## PHYSICS

# Latest Laboratory Aids

**Braille milliammeter, automatic X-ray processing unit, neon lamp to tell water conductivity and photo-slubber among equipment displayed.**

► THE LATEST scientific equipment from audible Braille milliammeters to photo-slubbers currently was under the sharp eyes of British scientists gathered in London to look over the Physical Society's 36th exhibition of modern laboratory aids.

A milliammeter, used to measure small electric currents, is constructed so that blind persons can feel its raised dial markings. An outside pointer arm can be set by the operator at the current value desired for the circuit under study. Current is gradually applied until the proper amount is flowing.

When that point is reached, the milliammeter's working pointer touches the outside pointer arm and a buzzer sounds inside the milliammeter telling the blind operator that the desired circuit current is flowing.

An automatic X-ray film processing unit on display can handle up to 960 X-ray films each eight-hour work day. From the time the radiographer puts the X-ray film into the developing solution, no hands touch it until it is required for viewing. In emergency cases, the X-ray film can be obtained as soon as it emerges from a light-trap and enters the washing stage.

Controlling the temperature of the developer is best done by thermostatically controlling the temperature of the dark room, the manufacturer reports. However, the developer temperature can be controlled by localized methods. A refrigerator unit is an "optional extra" when the machine is to be used in the tropics.

Neon lamps have been built into a device to indicate the conductivity of de-ionized water. As the conductivity of the water increases, more current flows between electrodes in the liquid and the rate at which a neon lamp flashes increases.

A second neon lamp can be set to flash at a constant rate corresponding to the desired conductivity of the fluid. By comparing the two flashing lamps, the operator can see whether the conductivity of the solution is what it is supposed to be. The range of the instrument can be varied by using different sizes of electrodes, or by spacing them at different distances.

The photo-slubber, though its name sounds like that of a machine from Mars, actually is nothing more than a device which watches yarn being wound on weaving cones. Excessively thick lengths of yarn are

called "slubs," and when woven into high-quality material reduce its commercial value.

The photo-slubber keeps its photo-electric eye focused on the yarn as it passes by at the rate of several hundred yards each minute. When the yarn becomes too thick, the eye signals an amplifier which fires a gas-filled tube which, in turn, operates electromagnetic snippers which cut the slub before it reaches the weaving cone. The slub then is removed by the operator.

## Porous Plug Curtails Cusswords

A device which the British report can "save many harsh words" is a small porous ceramic plug used as a mercury seal in pressure-measuring manometers. The plug has enough pores to allow air to pass through it easily. However, the pores are too small to permit mercury to spill out when small overloads are applied inadvertently to the manometer.

A pressure differential exceeding one atmosphere must be applied before the mercury will flow through the plug.

Problems of heating substances being studied under vacuum have been reduced by a radiant heating source. Heat from a gas-filled, tungsten-filament lamp is concentrated by an ellipsoidal reflector on the specimen under a glass, air-tight envelope.

A magnetic stirrer solves some other problems encountered in the laboratory when it is necessary to agitate a liquid without air getting to it. The magnetic stirrer is nothing more than a stoppered flask in which a small bar of metal lies.

The flask sits on a stand somewhat resembling a hot-plate. Strong electromagnetic fields are generated inside the flask stand. The magnetic field grips the little metal bar inside the flask and whirls it at speeds from 100 to 1,200 revolutions a minute, much in the same way as magnetic fields turn flywheels in electric clocks.

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## MARINE BIOLOGY

## Small Whale Fetus Displayed at Museum

► THE AMERICAN Museum of Natural History in New York now has on display "Oscar, the Unborn Whale." Oscar is the male fetus of a Finback whale, the smallest and best preserved whale fetus ever received by the Museum. Scientists calculate the fetus to be about six to seven weeks old. Its length is only 11 inches.

The baby whale, in spite of his early age, however, looks remarkably like an adult whale with well formed flippers although without the characteristic ventral grooves. Had Oscar been born he would probably have been 21 to 23 feet long at birth and would have been about 75 feet long upon reaching maturity.

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**SMALL WHALE FETUS**—Dr. Harold E. Anthony, chairman of the department of mammals of the American Museum of Natural History, and Benjamin J. Goldberg, SCAP representative on the 1950-1951 Japanese Whaling Expedition to the Antarctic who gave the whale fetus to the museum, examine the animal.

## GENERAL SCIENCE

# Problems of Scientists

Secret activities of President's loyalty boards and damaging effects of McCarran Act cited as among most serious problems facing scientists as responsible citizens.

By DR. E. U. CONDON

Director of Research, Corning Glass Works, Corning, N. Y.

*Excerpts from address delivered at the meeting of the American Chemical Society, Buffalo, N. Y., March 24.*

► . . . THE SCIENTISTS of this country are going to have to do a lot of educational work among our fellow-citizens and with Congress. Specifically, the scientists of every community should make it a point to call on and become personally acquainted with their own Senators and Representatives and go over with them carefully and in detail the problems confronting scientific research. This can be done in a spirit of mutual helpfulness—not of lobbying by pressure tactics—and if done in this way I am sure will be received sympathetically and gratefully by the members of Congress. Too much preoccupation with newspaper accounts of the antics of a few of them ought not be allowed to obscure the fact that nearly all of them are first-rate high type citizens who are conscientiously interested in doing a good job.

I want to come to another serious problem that now confronts not only scientists but all people in the service of the Federal Government. I refer to the unfair persecutions and intimidations and character assassinations to which Federal employees are being subjected, not only by Congress, but also at the hands of the President's loyalty boards. I think that the secret activities that are going on within this latter framework are in some ways more evil than the publicized actions of Congress. In any case, the combined effect of all such activities is greatly undermining the morale of the government service and greatly aggravating the difficulty which the Federal Government finds in getting men to expose themselves and their families to these hazards.

No honest person will distort the meaning of my remarks; I do not advocate carelessness about loyalty or trustworthiness of those in the Federal service. I merely ask that these matters be handled with intelligence. (Dr. Condon then cited a "shameless, outrageous and indecent" example of the hardships suffered by a physical chemist who gave money to a friend accused and later acquitted, in the Canadian atomic spy cases.)

I am sure nobody even on the Loyalty Board believes that there is anything wrong

with many people they suspend, but they live in fear that any show of reasonableness will some day form the basis of an attack on their own loyalty.

I do not believe the American people would condone the sort of thing that is going on if they knew about it, either from the point of view of effectiveness of the Federal service now greatly damaged by the excesses of the last few years, or from the point of view of fairness to fellow Americans. We should realize, above all as chemists, that it is not true that where there is smoke there is fire, there may be only a very nasty person with a smoke machine.

Finally, I want to talk briefly about another evil situation that is damaging the progress of science in this country and is doing much to damage the general prestige of our country among intelligent people abroad. I refer to the exclusion, and at best, the long delays and officious red tape where exclusion is not involved, affecting scientists from other countries who plan visits here for conventions and other purposes. This is being done in accordance with provisions of the McCarran Act, passed by Congress over the veto of the President.

As a result of the actual operations of this Act, a number of distinguished scientists have been kept out of this country and have been kept from making contributions at scientific conferences of importance to us. I was told that the situation had gotten so bad that last summer a conference was held on a scientific subject under military auspices in which it was desired to have several outstanding French scientists participate. Because of the delays and probable insurmountable difficulties which would be caused by the McCarran Act, the conference was held in Canada instead of the United States even though this put us to the expense of sending all of our participants out of the country to meet our foreign guests, and certainly put our country in a ridiculous light before the Europeans.

This Act should be amended at the earliest possible moment and it is important that scientists everywhere carefully explain this issue to their Congressmen in personal contacts. It is probably too much to hope that action on such a subject will be taken before the November elections so we will have to continue to have our country's scientific position damaged by this stupidity for some months longer.

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## ● RADIO

Saturday, April 19, 1952, 3:15-3:30 p.m. EST

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. John C. Bugher, deputy director, division of biology and medicine, U. S. Atomic Energy Commission, discusses "Atomic Radiation Effects."

## MEDICINE

### Test New TB Drug on Patients if Congress Willing

► PATIENTS IN 16 U. S. Public Health Service cooperating tuberculosis hospitals throughout the country will be the next, and presumably very willing, guinea pigs in trials of the new anti-tuberculosis drug, isonicotinic acid hydrazide, if present plans carry through.

First hurdle to be taken before these patients will start getting the new drug is appropriation by Congress of \$200,000 to finance the study. The 1953 appropriation bill for the Federal Security Agency, which includes the Public Health Service, has already passed the House. But President Truman has sent a request to the president of the Senate asking for the \$200,000 supplemental appropriation.

Budget Bureau Director Frederick J. Lawton explained in a letter of transmittal to the President that because the new drug was not announced until February of this year, funds for a clinical study project to determine its efficiency could not have been included in the original 1953 FSA appropriation bill.

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## TECHNOLOGY

### Sawdust Feeds Turbine For Running Sawmills

► AN EXPERIMENTAL sawdust-fed gas turbine has been developed which has reached combustion efficiencies up to 99%, bringing one step nearer the lumberman's dream of running his sawmills from waste wood.

George H. Atherton and Stanley E. Corder, engineers with the Oregon Forest Products Laboratory of Corvallis, Ore., reported to the American Society of Mechanical Engineers meeting in Seattle that with respect to furnace volume, the heat release rate in the experimental device is about 15 times greater than usually attained in most boiler installations using wood fuel.

The idea for the project was presented two years ago in a student ASME paper contest. Subsequent studies have indicated that sawmills in Oregon produce more wood waste fuel in the manufacture of lumber than is required to power the sawmills using this method.

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**OPERATION IN KOREA**—A captured North Korean getting front-line attention from a medical corps team of the First Mobile Army Surgical Hospital, X Corps, in Korea.

#### MEDICINE

## Artificial Kidney in Korea

► AN ARTIFICIAL kidney has been flown to Korea and is now being used in the hope of saving lives of wounded men. The men are those threatened by a kidney ailment that develops as a result of prolonged shock and repeated blood transfusions.

The kidney ailment is called lower nephron nephrosis. It is a condition in which the kidneys as a result of shock cannot eliminate the body wastes brought to them by the blood. The artificial kidney might take over this job temporarily while the wounded soldier's own kidneys recover from their shocked condition.

This kidney condition is one of the big hurdles Army surgeons would like to get over in order to save still more of our wounded. When surgeons saw this condition in World War II they had nothing to fight it with. Now they are trying the artificial kidney.

Fortunately, this kidney ailment is not common, but it occurs much oftener in military than civilian surgical patients because the shock factor can be controlled better in civilian patients.

Wounded soldiers, however, get effective treatment faster than the average civilian accidentally injured on the streets of cities here at home. Lt. Col. Kenneth Judy, surgical consultant to the Army Surgeon General, declared on his return from an intensive seven-weeks tour of hospitals and front-line battalion aid stations.

Within one and one-half hours after being wounded, the soldier is on the operating table at a MASH hospital and during that hour and a half he has had first aid dressings on his wounds, splints, whole blood transfusion, glucose and salt or plasma, morphine, anti-tetanus shot and other essentials in treatment of an accidental type of wound.

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#### MEDICINE

## Tall Men More Likely To Get Leg Vein Clot

► TALL MEN, six feet or over, seem likely to get a dangerous type of clot in the veins of their legs, Dr. Meyer Naide of the Hospital of the University of Pennsylvania, Philadelphia, reports in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (April 5).

The clots in six patients he reports on developed after severe physical strain or for no reason at all, but not after operations, cancer, prolonged illness or involved superficial varicose veins which are conditions that often precede clots in leg veins.

Thrombosis, or clots, in the leg veins of tall men are more likely to result in pulmonary emboli, plugging the lung artery or one of its branches, Dr. Naide states. This dangerous result came to five of his six patients.

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#### BIOCHEMISTRY

## One Chemical Speeds Healing of Wounds

► TO SPEED the healing of a wound, whether in battle or in an operating room, the human body needs one particular chemical, a protein building block called cystine.

Dr. Martin B. Williamson, of Loyola University School of Medicine, Chicago, announced to the American Chemical Society meeting in Milwaukee that without this amino acid chemical, or proteins containing it, in the diet the wound will heal more slowly, stealing the chemical needed from other body tissues.

Experiments by Dr. Williamson and Dr. Herbert J. Fromm on rats, whose food could be controlled, demonstrated that wound healing is promoted by diet additions of cystine, or methionine from which cystine can be made in the body, or proteins that contain these substances.

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#### MEDICINE

## No Upset With New Aureomycin and Terramycin

► A NEW medicine has been found for patients who are bothered by nausea and vomiting when taking aureomycin or terramycin by mouth. It is an aureomycin preparation called aureomycin calcium caseinate.

Trials of the new preparation at the Mayo Clinic, Rochester, Minn., show that the aureomycin of the new preparation reaches the blood stream in about the same amounts as from regular aureomycin taken by mouth. This means it should be equally effective in stopping disease germs.

In a group of 24 patients given the new preparation, 20 had no loss of appetite, nausea or vomiting. Loss of appetite only occurred in one patient, nausea in two and nausea and vomiting in one. Of six who had previously suffered nausea and vomiting while taking regular aureomycin, five were completely free from these symptoms when taking aureomycin calcium caseinate. One patient was not helped. A seventh, who had nausea only with regular aureomycin, had considerable but not complete relief with the new drug.

In three patients who could not take terramycin because of nausea and vomiting, the new preparation was substituted with complete relief.

The results with the new preparation were reported by Dr. Paul R. Manning, a fellow in medicine at the Mayo Foundation.

Milk and sodium bicarbonate given with aureomycin have usually controlled the nausea and vomiting, but, Dr. Manning points out, these cannot be given to patients on a low salt diet. Having the antacid and the aureomycin all in one pill is a further advantage for the patient's convenience.

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## VETERINARY MEDICINE

**Suggest Rejuvenating Bulls By Sex Gland Grafts**

► **REJUVENATION BY** Voronoff's sex gland grafting methods of 30 years ago should be used now to prolong the usefulness of expensive bulls and other livestock shipped abroad under public and private programs of aid to underdeveloped countries.

So declares Dr. Joseph Y. Peary of Alderson Broaddus College in Philippi, W. Va.

Voronoff's experiments, which included human cases as well as those of bulls, rams and other senile sires, were made 30 years too soon, Dr. Peary says.

In the human cases, glands from apes were used. The withering and resorption of the transplants due to incompatibility of tissues of different species might be overcome now that so much more is known about factors influencing tissue growth, Dr. Peary says.

In Voronoff's animal experiments, however, he used glands from animals of the same species to graft into the glands of sexually worn out males. At that time, 30 years ago, "the expense involved must have appeared excessive in relation to rejuvenating a bull for only a breeding season or two of effective service," Dr. Peary comments in a report to the journal, *SCIENCE* (March 28).

"Not so," he states, "in our own era of artificial insemination and of egg implantation into foster mothers, when the reproductive power of a progenitor is spread over a much larger herd or flock."

Costly animals shipped to underdeveloped countries, Dr. Peary points out, may become prematurely sterile in an adverse climatic environment. It is for this reason he advises reviving Voronoff's gland grafting methods of rejuvenation.

*Science News Letter*, April 12, 1952

## PSYCHOLOGY

**Harvard Men Play Pinball in Gambling Study**

► **WHY DO** intelligent people keep on placing bets even when they know that in the long run they are bound to lose, rather than put their money on a sure thing?

The answer to this and other questions about why and how people gamble was sought in experiments at Harvard University, Cambridge, Mass., where 12 students were asked to make their choice of bets as to how the balls of a pinball machine would fall.

The results were reported to the Eastern Psychological Association meeting in Atlantic City by Dr. Ward Edwards of Johns Hopkins University, Baltimore, as follows:

All the students followed the same general pattern of betting and this did not change much when the men just imagined

they were betting, when they were betting for worthless tokens or when they were losing or gaining real money.

Having decided on their preferred bet, the men then tried their luck on a pinball machine described by Dr. Edwards as "the fairest gambling device in the history of gambling." The ball was just as likely to fall into any one of its eight boxes as it was to land in any other.

People like to take a 50-50 chance to win a moderate amount rather than a good chance to win a small amount or a poor chance to make a killing, Dr. Edwards found from these experiments.

The long shots are, however, more preferred when real money passes hands than when the gambling is for just chips.

Losing betters make a different kind of choice. People prefer a low probability of losing with a large amount lost rather than a high chance of losing a smaller amount.

*Science News Letter*, April 12, 1952

## MEDICINE

**Vitamin B-6 Treats One Leukemia, Speeds Another**

► **A KIND OF** Jekyll-Hyde role for one of the B vitamins in leukemias has been discovered by Drs. Robert W. Heinle and David R. Weir of Western Reserve University School of Medicine, Cleveland.

The vitamin is B-6, or pyridoxine. Lack of this vitamin may speed the the course of one kind of leukemia, the myeloid type, and treatment with it may in some cases reduce symptoms.

Patients with another type of leukemia, acute lymphatic, however, may be helped by a deficiency of B-6. The deficiency was brought about in two adult patients by doses of another chemical, desoxypyridoxine. The two patients showed some improvement when given this chemical, but the doctors warned, in their report to the National Vitamin Foundation meeting in New York, that "further evaluation of its effectiveness is required".

*Science News Letter*, April 12, 1952

## BIOPHYSICS

**Ultraviolet TV Will Aid Biologists**

► **COLOR TELEVISION** cameras sensitive to ultraviolet light soon may be coupled with microscopes to produce color pictures of clear specimens on television screens.

Designed to eliminate the old system of staining specimens, the new method is based upon the principle that different parts of the specimen absorb different amounts of ultraviolet light. The television camera translates those different amounts of ultraviolet light into regular colors used in color TV. Engineers who developed the system said various parts of the specimen could be seen with individual clarity.

*Science News Letter*, April 12, 1952

**IN SCIENCE**

## MEDICINE

**Male Mice May Infect Females with Cancer**

► **MALES MAY** infect their wives and, through them, their children with a breast-cancer-producing virus if the results of experiments with mice can be applied to humans.

The virus is thought to be transmitted to the children in their mother's milk.

Dr. John J. Bittner, University of Minnesota scientist, reported in Minneapolis that men may transmit the breast cancer virus to their wives at the time of mating.

However, he said, the men merely serve as carriers of the virus. They seldom develop breast cancer themselves.

Dr. Bittner mated male mice that had been nursed by mothers with the breast cancer virus with female mice without either breast cancer or the virus. Along about the third or fourth litter produced by this kind of mating, the mother mice came down with breast cancer. It evidently took several chances for infection before they got the virus from their mates.

The female children from these later litters also developed breast cancers. They got it from their mother's milk, Dr. Bittner thinks.

*Science News Letter*, April 12, 1952

## TECHNOLOGY

**Explosive Charges Heal "Sick" Water Wells**

► **A METHOD** of treating "sick" water wells to increase the yield by as much as 300% was reported to the meeting of the American Society of Mechanical Engineers in Seattle by Harvey A. Mylander of the Water Supply Analysts, South Pasadena, Calif.

The process uses small explosive charges accurately spaced in the well casing and set off at calculated time intervals to produce a continuous vibration in the well. Mr. Mylander said the shock waves, which continued over a relatively long period, were powerful enough to dislodge obstructions in the well and would cleanse the perforations in the well casing.

He said clogged casing perforations "nine out of ten times" cut the production of the "sick" wells. Conventional chemical and mechanical methods used by well drillers and well servicing firms to remove the organic growths or deposits from the perforations produced short-lived results, were only mildly effective, or were too expensive. Swabbing, another cleansing method, produced only temporary relief, he said.

*Science News Letter*, April 12, 1952

# SCIENCE FIELDS

## ENGINEERING

### Protect Atomic Workers From Hazards by Air Locks

► **AIR LOCKS** which form a part of the ventilation system currently being used in some atomic plants to protect workers from radiation and toxic hazards were described to the American Society of Mechanical Engineers meeting in Seattle by W. W. McIntosh of the General Electric Co.

Mr. McIntosh reported different zones in atomic plants have been separated structurally and kept at different air pressures so that ventilating air always flows from the less to the more hazardous zone when doors to those zones are opened. The air then is exhausted near the place in the room where the hazard is the greatest.

A second system he described uses powerful exhaust fans to draw fresh air into the plant at the least hazardous spots and to pull it on through the plant to more dangerous spots. Finally it is exhausted at the most hazardous spot.

Before exhaust gases are discharged into the outside air, waste particles are filtered out and then the gas itself is scrubbed. Final discharge point of the gas may be from a stack 200 or more feet in height to obtain a further safety margin, he added.

Science News Letter, April 12, 1952

## GENERAL SCIENCE

### 100% Handicapped Persons Run Successful Businesses

► **PHYSICALLY HANDICAPPED** persons may be given new heart and hope of obtaining employment from the appearance in Washington of men and women who are self-supporting in spite of almost complete disability.

Telling their success stories before the National Conference on Placement of Severely Handicapped, these young people showed employers and fellow victims of crippling disease that it is not necessary for the handicapped to be helpless and dependent.

Among them are:

Miss Mary Krasnagor, a pretty girl in her early 30's from Framingham, Mass. She has been crippled most of her life, suffering from muscular dystrophy. Now she is confined to a wheelchair, unable to walk at all and with very little use of her hands. Some years ago she was declared "non-feasible," that is, no employment could be found for her, so she decided to strike out in business for herself. Today she operates one of the most successful real estate concerns in her area. She owns her own home and supports a father as well as herself, going back and

forth to an office to conduct her business which she handles largely by telephone.

Another wheelchair patient, Roger Arnett, with one leg amputated and the remaining one paralyzed, runs his own gladioli farm at Columbus, Ind.

Lovely young Miss Iride Valmassy, also a muscular dystrophy patient, holds down a job with the campaign division of the National Foundation for Infantile Paralysis in Detroit, working in a wheelchair. Unlike Miss Krasnagor, Miss Valmassy has full use of her hands, however.

Ralph Buckley, a paraplegic of Nashua, N. H., has been supporting himself at clerical work in a textile plant.

In addition to their regular work, these people have been contributing their services to aid the handicapped.

Science News Letter, April 12, 1952

## MEDICINE

### Chemical X in Marrow Seen as Leukemia Aid

► **CHANCES** of curing leukemia patients now seem much better, thanks to discovery at the National Cancer Institute, Washington, of an anti-radiation substance that might also be curative for any future atom bomb victims.

The substance, so far called X because its identity is not known, exists in bone marrow. Transfusions of living bone marrow save animals from radiation death when given even several days after otherwise fatal doses of radiation, Dr. Egon Lorenz has found. Even very small amounts of substance X are effective.

For the leukemia patients the hope is that this substance would make them able to stand much larger doses of radiation, perhaps large enough ones to cure the leukemia.

The work is still in the early experimental stages. Among problems to be solved are finding the substance in bone marrow that has this anti-radiation effect and then finding ways of getting enough of it to use for trials and perhaps treatment of patients.

Science News Letter, April 12, 1952

## TECHNOLOGY

### Big Plastic Bottles Can't Break With Crash

► **THE WORLD'S** largest unbreakable plastic bottles for transporting large quantities of poisonous or corrosive acids were exhibited at the National Packaging Exposition in Atlantic City.

Capable of holding 13 gallons, the polyethylene containers are blow-molded in one piece by Plax Corp., Hartford, Conn. Used in plywood containers designed by Greif Bros. Cooperage Corp., Delaware, Ohio, they form the first smash-proof carboys ever produced.

Science News Letter, April 12, 1952

## BIOLOGY

### Tree Frog Now Coming Out of Winter Hibernation

See Front Cover

► **COMING OUT** of hibernation about now is the tree frog, or tree toad, as it commonly called. This frog leads a varied life as it passes through the different seasons of the year.

During the cold winter months it hibernates in the ground, generally under the mud in the bottom of a pond. In the spring it lives in a shallow pond during its mating season. After its jelly-like masses of eggs have been deposited in the water, the frog goes up into the trees and bushes to live until cold weather returns in the late fall. Color changes possible for the amphibian are through buff, gray, olive and pale green to almost white.

A tree frog is difficult to locate in a tree because it flattens itself out to look like a piece of lichen on the bark of a tree, becoming dark gray or tan on a dark tree trunk. It is well known, however, from its familiar tree-frog song which it usually sends out just before a rain. As it sings it blows up its throat to immense proportions, as shown on the cover of this week's SCIENCE NEWS LETTER.

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## ENGINEERING

### Furnace Burns Liquor Wastes From Paper Plants

► **CALCIUM-BASE SULFITE** liquor, a stream-polluting waste product from paper mills, can be burned in a furnace described at the meeting in Seattle of the American Society of Mechanical Engineers by H. A. Sorenson of the division of industrial research at Washington State College.

Disposing of sulfite liquor has been a problem to paper mills, Mr. Sorenson said. The simplest and cheapest way to dispose of it is to dump the waste into nearby streams and rivers. But public opposition and legislation indicated another solution to the problem was needed.

An eight-foot-long, sheet-steel, horizontal cylinder insulated on the inside with firebrick was constructed at the college for experimental burning of sulfite liquor. A conventional-type oil burner was placed in one end of the furnace from which oil was sprayed into the furnace, producing a fire to burn the sulfite liquor. A steam-atomizing oil burner nozzle was used to spray the sulfite liquor into the furnace. Later it was discovered that the liquor would burn without the support of the conventional oil burner.

Efficiency of the furnace was figured to be 76%, but making the fire more turbulent should raise the figure substantially, Mr. Sorenson reported.

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## OCEANOGRAPHY

# Beautiful, But Dangerous

**Towering white mountains are deceitful in appearance, with vast bulk hidden under water. International Ice Patrol now maintaining continuous watch on their location.**

By ANN EWING

► **TOWERING WHITE** mountains, many as big as ten Empire State Buildings, are again a menace to North Atlantic shipping.

These floating icy islands are Greenland's largest export. The U. S. Coast Guard's International Ice Patrol, supported by the main shipping nations of the world, spots the icebergs, tracks the big ones as they wander southward with the ocean currents. All shipping is warned when icebergs get dangerously close to much-used lanes.

Twice daily radio broadcasts announce the latest iceberg information. The great white masses are detected by patrol ships, by planes and by war-developed radar and loran. Radar and loran, however, are supplemental to actual visual patrol, either by plane or ship. Shipping lines and ship captains have learned that the best way to avoid trouble with icebergs is to stay out of their way, so courses are shifted southward whenever necessary.

Icebergs are the mighty tips of glaciers—sizable hunks of snow so hard packed the pressure has changed them to ice. They break off from the ice sheets that cover much of the land areas in the far north and far south. Such an ice sheet is formed when temperatures are so low that one layer of snow does not melt before the next snowfall.

## Ice Cap Mile Thick

As the ice sheet gets thicker and thicker, its edges begin to creep, at little more than geologic speed, toward sea level, pushed on by the weight of many years' snows. Greenland, except for a small coastal fringe, is covered with a high, thick ice cap that produces nearly all the bergs seen in the North Atlantic. Shaped like a shield, this ice cap is estimated to be nearly a mile thick in places.

The ice mantle moves down the slope of the land toward the sea, taking the line of least resistance. Near the coast the valleys are filled by these rivers of ice which have their fronts projecting through the fjords out into deep water.

The ice noses out into the water until buoyancy lifts it up, and then the front of the glacier breaks off at a weak spot.

With a great roar and a splash, the glacier fragment plunges into the sea, an ice mountain ready to start its long journey southward. Ocean currents influence the

where and how fast of an iceberg's travels. The influence of the wind is usually small compared to that of the currents, of which there are three main ones:

The East Greenland current is an overflow from the polar basin, going southwesterly along the east coast of Greenland to the land's tip, then around and northward along the west coast of Greenland until it reaches about 65 or 70 degrees north latitude. There it shoots off branches westward to the Labrador current.

The Labrador current has its source in Arctic regions, where it is known as the polar drift. Upon passing through Davis Strait, the current assumes stream flow and becomes known as the Labrador current. Its major stream flows southeasterly, reaching and completely flooding the northern part of the Newfoundland Banks where it branches, one definite stream continuing southward down the east side of the Grand Banks. This is the part of the Labrador current that brings the bergs southward to menace steamship tracks.

When the Gulf Stream, the third main current, leaves the coast of the United States, it gradually shifts direction until near the Banks its flow is eastward. Just east of the Grand Banks, it breaks sharply and flows in a northerly direction again.

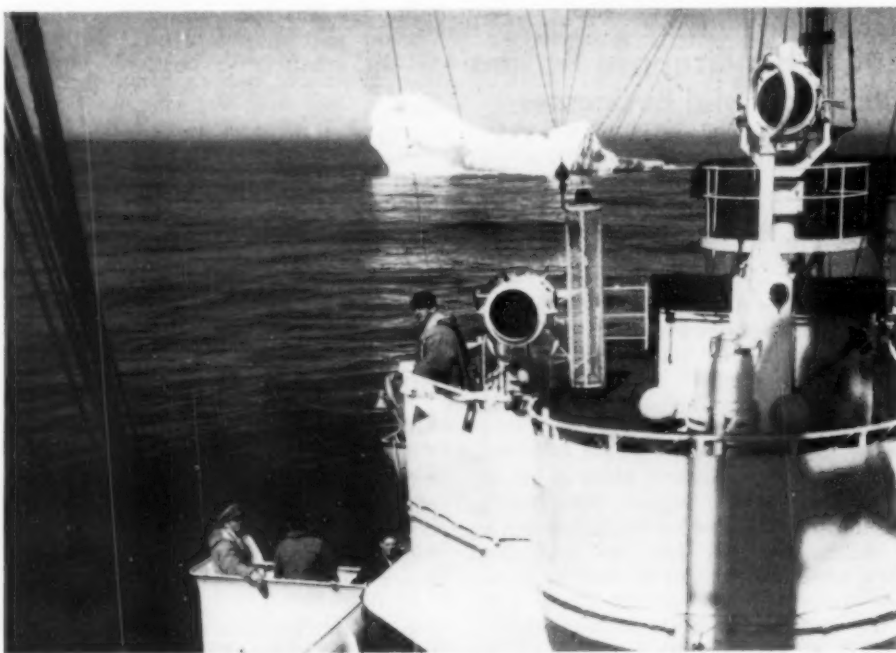
## Called Cold Wall

The cold wall is the name given to the boundary between the Gulf Stream and the Labrador current. Off the Grand Banks this wall is nearly perpendicular in position and extends downward sometimes as deep as 1,500 feet.

It is not unusual at this place for sailors to be able to go swimming in the warm Gulf Stream, while within sight of their ship, possibly as close as one-half mile away, floats an iceberg. This region, where Arctic and tropical waters meet, exhibits the greatest hydrographic contrasts to be found anywhere in the world.

From the day the bergs appear off Newfoundland, they are tagged and tracked by the International Ice Patrol. Already they have traveled some 1,800 miles.

Icebergs calved from the west Greenland glaciers one summer usually spend their first winter in the vicinity of Melville Bay, their second winter in the neighborhood of Cape Dier and reach the Grand Banks during the following spring and summer. Most



**FLOATING ICE MOUNTAIN**—A U. S. Coast Guard vessel on ice patrol notes the location of this huge hunk of ice. Transatlantic shipping routes are shifted southward when the menacing masses approach close to the usually used lanes.



of them have disintegrated before they reach the Grand Banks, and some have come by longer and others by shorter travel periods.

### Icebergs Calve Growlers

But when they come close to the Grand Banks area, they are marked wanderers. Estimated positions of bergs are radioed twice daily. The only sure sign of an iceberg, however, is to see it. On a very clear day, large bergs can usually be seen from an eye height of 70 feet at a distance of 18 miles. But in a light fog or drizzling rain, the berg is visible only one to three miles away.

Icebergs in the warm water of the Gulf Stream give off cracking sounds as they melt. When a growler is calved, or a quantity of ice sloughed off from the side of a berg, it gives off a thunderous roar as it falls into the water. A growler is a low-lying piece of glacier ice not so large as a berg.

The bergs are deceitful in appearance. The amount to be seen above the water is small compared to the vast bulk that lies hidden beneath the surface. Yet large icebergs are frequently a city block long and half as high just above the water!

Floating ice displaces its own weight in water, so that close to 85% of a berg's bulk is hidden under the ocean's waves. And this is one of the deadliest of the iceberg's dangers, because jagged edges of ice pro-

trude far out under water from the visible mass.

There are nearly 100 tidewater glaciers along the west coast of Greenland. Most of the bergs that threaten North Atlantic shipping lanes, however, come from 20 glaciers, with such names as Humboldt, King Oscar, Umiamakko and Little and Great Karajak.

An estimated 7,500 sizable icebergs break off from the West Greenland glacier every year. Of these, an average of only 428 reach the Grand Banks, though the number varies from year to year. It has been known to go as high as 1,350 sighted south of the 48th parallel in 1929. On the other hand, in 1931, not a single white specter was spotted below that line, and there have been many years, including 1951, when less than ten bergs were found that far south.

The bergs drift leisurely, and their speed varies, averaging about 10 miles per day, although some have been clocked at 30 to 40 miles a day for six days.

Forty years ago, the liner TITANIC, on her maiden voyage, ripped her starboard flank on the protruding underwater edge of an iceberg, and 1,517 of her passengers lost their lives. The need for protection of transatlantic shipping during the iceberg season, brought to worldwide attention by this tragic sinking, resulted in formation of the International Ice Observation and Ice Patrol Services.

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### PSYCHOLOGY

## Toothache Nerves Tested

► A GROUP of 45 University of Rochester students gave themselves temporary but painful toothaches to help Dr. Paul Swartz of Hobart College, Geneva, N. Y., learn more about pain and other sensations in teeth.

Toothache was produced in these young men and women by applying electric current to the amalgam filling in a tooth. This is what a dentist does when he wants to find out whether a tooth nerve is dead or not.

In this case, the student himself gradually increased the current applied until he could feel it. What he felt at first was not pain but another sensation surprising to Dr. Swartz because the only sense organs in the tooth are believed to be those of pain.

The point at which pain was felt differed for different individuals but averaged about 100 microamperes. Then the students were instructed to go on pushing up the current until they could stand it no longer. Surprisingly, some went on until they had gotten the current up to 1,500 microamperes. At this point they were stopped to prevent any possible damage to the tooth.

Results did not reveal that either men or women can stand toothache better than

the other sex. After reaching the upper limit of pain tolerance, the students were then asked to set the current down until the pain experienced was just half what it was at the maximum. It was found that this half-way point in intensity of pain exactly corresponded to the half-way mark in application of current.

In spite of their willingness to endure pain for science, the students nevertheless did miss their appointments occasionally just as do those going to a dentist.

Dr. Swartz reported his study to the Eastern Psychological Association meeting in Atlantic City.

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### METEOROLOGY

## Weather Pattern Reverses Over Nation for April

► A REVERSAL of the weather pattern during the period until the end of the month, with the western half of the nation scheduled for warmer than usual weather and the eastern seaboard states for colder than normal, was foreseen by long-range forecasters at the U. S. Weather Bureau.

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## INVENTION

## Fabric Guards Silver From Tarnishing Gases

► A METHOD and material for keeping silverware from tarnishing while it is not in use received patent number 2,590,094 from the U. S. Patent Office.

The material can be formed into bags, pouches or rolls, or it can be used as lining for chests and boxes in which silverware is stored. The method of manufacturing and the fabric were invented by Birger Egeberg and Jean P. Phaneuf, both of Meriden, Conn., and Malcolm A. Orr of Southington, Conn. Their patent has been assigned to the International Silver Co., Meriden, Conn.

Under ordinary conditions of storage, silverware tarnishes because sulfide and other gases react with the silver to produce silver sulfide, which is tarnish. By incorporating silver strands in the material, the inventors claim the metal will react with the tarnishing gases and allow only "clean air" to reach the silverware inside the fabric.

The silver strand, a fine wire, is wrapped around a regular piece of yarn woven into the fabric. Because the tarnish preventive is not a chemical, the material can be washed without losing its effectiveness. And because the metallic strands are buried in the cloth, the fabric can be dyed satisfactorily to desired colors, they said.

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## BOTANY

## NATURE RAMBLINGS



### Children's Favorites

► WHEN CHILDREN come running and shouting, with the first violets clutched in their eager little fists, then we know it is really spring.

Violets are not the first spring flowers to open, any more than robins are the first spring birds to appear; yet somehow their cheerful faces make us feel that this time it is spring and no mistake, no mere premature warm spell, deceiving us with false hopes. There may be more psychology than phenology about it, but that is the way we all feel.

Violets have a good, well-won right to their place as the proper heralds of spring.

## RADIO

## Far-Off Radio Reception

► A MOMENTARY testing technique developed at Stanford University, Stanford, Calif., by two radio hams can tell radio operators at a glance how reception will be in far-off places.

The method, termed "scatter sounding," possibly will revolutionize present-day radio propagation methods, in the opinion of the American Radio Relay League at West Hartford, Conn.

As developed by Oswald G. Villard, Jr., and Allen M. Peterson, both of Stanford University, the system uses a transmitter which sends pulses of radio energy into the air. When the radio waves strike the earth at some distant point, they bounce in all directions. Some bounce back to the transmitter.

Those returning waves are received visually on an oscilloscope, an instrument having a cathode-ray tube similar to TV picture tubes. The electron beam in the tube can be made to show in terms of distance where the original pulsed signal struck the earth.

The patterns created on the oscilloscope screen reveal the edges of skip zones, areas

For all their delicacy and tininess, they are a hardy and adaptable tribe, that have spread their blue-and-yellow banners to all the cool winds of earth.

There are something more than 300 species of violets, ranging through all temperate lands of the world. They are found on mountain-tops and in desert valleys below sea level; some species grow with their roots embedded in the wettest of swamp muck, others precariously clinging to rock shelves.

Violets are often thought of as exclusively woodland flowers, yet some of the most beautiful and hardy of them are to be found among the wind-blown grasses of the open prairie. Blues, yellows and white are their natural colors; one species, *Viola tricolor*, combines all three, and in the hands of generations of plant breeders has become the familiar garden pansy.

There is one encouraging thing to be noted about violets, too, so far as children are concerned. They may pick all they like, so long as they do not pull the plants up bodily by the roots. Violets do depend a great deal on seed for their propagation, but relatively few of their seed are formed by the bright little flowers that children love to gather.

After spring has passed, the plants produce a second crop of flowers on very short stems down among the bases of the leaves. These flowers, which most of us would mistake for buds, have no petals and never open. They fertilize themselves internally with their own pollen, and thus insure well-filled seed capsules.

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which are by-passed by radio waves because of changes in density and height of the radio-wave-reflecting ionosphere. By observing the patterns, a trained eye can tell fairly accurately just where radio reception will be good, fair, poor, or impossible.

Experimental data were correlated with actual radio contacts with other hams made throughout the United States during the test period. The findings indicate that the theory of scatter sounding is correct, and that the technique can be used by radio operators with the aid of ordinary amateur transmitting and receiving equipment.

Back scatter reflection from objects on the ground was first announced by T. L. Eckersley in England about 20 years ago. A technique for measuring it was proposed by Dr. Newbern Smith of the National Bureau of Standards in a report issued by the Interservice Radio Propagation Laboratory during 1945. Separate research on scatter sounding currently is in progress at the Bureau of Standards.

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## BIOCHEMISTRY

# Aid Drug Addiction Fight

► A NEW aid in the fight against drug addiction has been found. It is a chemical derived from morphine, called Nallylnormorphine. This chemical does not cure morphine addiction, but promises to be a good diagnostic tool for detecting morphine addicts.

If, for example, a doctor wants to know whether a patient is an addict lying about it in an effort to get a prescription for more of his drug, the doctor can give a small dose of the new chemical. The patient's reaction will quickly show whether or not he is an addict.

Persons who have had an overdose of morphine or certain other pain-relieving drugs can be rapidly restored by this new morphine derivative. It acts as an antidote to morphine and its derivatives and to meperidine and methadone.

Its antidotal action may help save new babies whose mothers have been given meperidine to ease childbirth pains. Baby's first breath is taken more promptly, often after the head has been delivered, and the first cry comes faster, doctors have reported.

This childbirth use of the drug and its use as a diagnostic tool for drug addiction are still in the experimental stage, while proper dosages and methods of giving it are checked.

The drug is now available, however, for use as a morphine antidote. It is not active against barbiturates or anesthetics such as cyclopropane or ether. Because it is an opium derivative, it is subject to Federal narcotic laws and is available only on prescription. It is marketed under the trade name, Nalline, by the manufacturer, Merck and Co.

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## CYTOLOGY

# Growth-Secret Discovery

► THE SECRET of why we grow has been almost completely isolated, it was announced in Chicago.

Infinitesimal fractions of an extract from unborn chicks have been applied to cells taken from the bone marrow and placed in a tissue culture. This substance makes the cells divide for as many as 12 to 14 days. Cell division is the way we grow from the egg to the adult.

The work is being done by Dr. George M. Hass and his associates at the University of Illinois. Dr. Albert W. Schweitzer said that this is the first time, to his knowledge, it has been possible to continue the division of cells outside the body for so long a time.

The scientists are confident it is the tiny fraction of stuff from the chick embryo which contains the growth factor and which promotes the cell division.

The next stage in this research is to produce larger quantities so that chemical analysis can be made of it. Most of the material, they believe, is contained in the cytoplasm, or outside layer of the cell, very little is from the nucleus.

Dr. Schweitzer said that this might be quite effective in healing wounds because it would stimulate the growth of new tissue. His cells divide at the rate of once every 24 hours, just as fast as the fastest normal or abnormal cells in the body.

Drs. Hass and Schweitzer and Dr. M. C. Li, another associate, hope that final isolation of the growth factor will lead to new knowledge of how cancerous cells grow.

Science News Letter, April 12, 1952



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## INVENTION

## Sterilizing Vacuum Cleaner Has Ozone Producing Device

► A STERILIZING vacuum cleaner designed to overcome some disadvantages of similar machines has been invented by Jefferson P. Buckey of Easton, Conn., now deceased, and awarded patent number 2,590,152. The machine incorporates a ray-emitting and ozone-producing device in the nozzle of the cleaner which acts upon the dust and air carried into the sweeper as well as upon the material being cleaned.

Science News Letter, April 12, 1952

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# Books of the Week

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**THE ADOLESCENT**—Marynia F. Farnham—Harper, 243 p., \$3.00. Giving parents a great deal of information about their teen-age boys and girls and their development, physical, mental and emotional, that should help in the solution of their problems.

**THE BOOK OF GAMES**—G. S. Ripley—Association Press, 236 p., illus., \$3.00. Directions for games, puzzles, exhibits and other material useful to scout leaders and educators.

**BRIEF TRIGONOMETRY**—Edward A. Cameron—Holt, Rev. ed., 153 p., \$2.10. The attempt of the author is to present the essentials of the subject in a concise, readable manner so that the student can learn in a minimum time.

**CONCENTRATION OF A HYPERGLYCEMIC FACTOR FROM URINE OF SCHIZOPHRENICS**—Marcus S. Morgan and Francis J. Pilgrim—Mellon Institute, 6 p., paper, free upon request to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa. The tests indicate the factor to be a protein or a material bound thereto. It is not present in normal male urine.

**THE CONCEPTUAL FRAMEWORK OF PSYCHOLOGY**—Egon Brunswik—University of Chicago Press, International Encyclopedia of Unified Science, Volume I, Number 10, 102 p., paper, \$2.00. Summarizing the thinking behind modern psychology.

**CROCODILE-HUNTING IN CENTRAL AMERICA**—Karl P. Schmidt—Chicago Natural History

*Museum*, 23 p., illus., paper, 25 cents. A vivid description of the author's experiences harpooning crocodiles in a lake full of them, a lake with rainbow-striped water.

**ELECTROLYTIC MANGANESE AND ITS ALLOYS**—Reginald S. Dean—Ronald, 257 p., illus., \$12.00. The author directed the research which developed a practical method for producing electrolytic manganese from domestic ores. This book outlines the progress made in the art since that time.

**FAMOUS NATURALISTS**—Lorus J. and Margery J. Milne—Dodd, Mead, 178 p., illus., \$2.50. Biographical sketches of great men, prefaced by their portraits, intended to introduce children to the individuals who have contributed most to our knowledge of plants and animals.

**A FOCUSING CELL REFRACTOMETER**—L. E. Ashman, W. S. Schwartz and H. E. Jones—Mellon Institute, 3 p., illus., paper, free upon request to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa. A method for continuously recording the refractive index of transparent liquids.

**THE FOUR AGES OF TSURAI: A Documentary History of the Indian Village on Trinidad Bay**—Robert F. Heizer and John E. Mills—University of California Press, 207 p., illus., \$3.75. The authors urge the preservation of this important archaeological site which has seen the coming of the ships of the Spanish crown, the English crown and the sea-otter fur traders.

**GARDENS AND GARDENING, VOL. 3: HARDY PLANTS**—F. A. Mercer and Roy Hay, Eds.—Studio, 142 p., illus., \$5.00. This volume gives you an idea of how English gardens can retain their fine charm in a time of austerity through hardy plants that are not costly.

**HANDBOOK OF CARDIOLOGY FOR NURSES: The Disease, the Patient, Modern Concepts of Treatment**—Walter Modell—Springer, 246 p., \$3.50. A book especially for nurses who have the care of patients with this ever-increasing disease.

**HANDBOOK OF TURTLES: The Turtles of the United States, Canada, and Baja California**—Archie Carr—Cornell University Press, 542 p., illus., \$7.50. Includes 79 species and subspecies of turtles. A wealth of information is provided for those interested in these creatures.

**THE HELEIDAE OF CALIFORNIA**—Willis W. Wirth—University of California Press, 266 p., illus., paper, \$2.00. These insects have been long neglected in spite of the annoyance they cause. They include among other familiar pests, sand-flies, punkies, no-see-ums and gnats.

**HOW TO GROW RARE GREENHOUSE PLANTS: 260 Flowering Varieties for Amateur and Florist**—Ernest Chabot—Barrows, 182 p., illus., \$4.00. All plants described are flowering and self-perpetuating. All can be successfully grown in pots, and many will do well for years without shifting or transplanting.

**INDUSTRIAL HYGIENE FOUNDATION ANNUAL STAFF REPORT**—C. Richard Walmer—Mellon Institute, 4 p., paper, free upon request to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa.

**THE INTEGRATION OF BEHAVIOR, VOLUME I: BASIC POSTULATES**—Thomas M. French—University of Chicago Press, 272 p., \$5.00. Before behavior can be predicted, the author says, we must learn the interrelations between motives and how many motives may interact to determine what a person will do.

**IT'S FUN TO KNOW WHY: Experiments With Things Around Us**—Julius Schwartz—McGraw-Hill, 125 p., illus., \$2.25. Interesting experiments that children can work to find out lots of curious things about the everyday world around them.

**LAND FOR TOMORROW: The Underdeveloped World**—L. Dudley Stamp—Indiana University Press and American Geographical Society, 230 p., \$4.00. In our enthusiasm to help the peoples of the "underdeveloped lands", the author points out, we may do irreparable harm if we take to alien environments preconceived knowledge or ready-made solutions based upon experience elsewhere. By an expert in land use.

**OUR GARDEN SOILS**—Charles E. Kellogg—Macmillan, 232 p., \$4.00. A book for the home gardener telling how to make the most of your soil especially if it happens to be poor—too clayey, too sandy, too wet or too dry.

**THE PREPARATION AND PROPERTIES OF (HYDROXYORGANO)-SILANES AND RELATED COMPOUNDS**—John L. Speier—Mellon Institute, 8 p., paper, free upon request to publisher, 4400 Fifth Ave., Pittsburgh 12, Pa. Contribution from the multiple fellowship on technical glassware at Mellon Institute.

**SECONDARY SCIENCE EDUCATION**—Harrington Wells—McGraw-Hill, 367 p., illus., \$4.50. To provide teachers and student teachers with an orientation with regard to activities and objectives both in and beyond the secondary school laboratory.

**SIMPLIFIED RADIO SERVICING BY COMPARISON METHOD**—M. N. Beitman—Supreme Publications, rev. ed., 92 p., illus., paper, \$1.50. Introducing a simplified technique of radio repair.

**A STUDY OF THE POLYETHYLENE GLYCOLS AS VEHICLES FOR INTRAMUSCULAR AND SUBCUTANEOUS INJECTION**—Charles P. Carpenter and C. Boyd Shaffer—Mellon Institute, 3 p., paper, free upon request to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa. The findings reported here justify, in the opinion of the authors, the clinical trial of these vehicles.

**UNDER THE SEA-WIND: A Naturalist's Picture of Ocean Life**—Rachel L. Carson—Oxford University Press, 314 p., illus., \$3.50. A new and corrected edition of an early work by the author of "The Sea Around Us" which likewise shares with the reader the poetry of bird and fish life along the shore.

**THE WHITE LADY**—Leonard Dubkin—Putnam's, 165 p., illus., \$3.00. The life and habits of bats told as the biography of one particular albino with which the author made friends where it nested in a Chicago open lot.

Science News Letter, April 12, 1952



## A Key to Precious Stones

By L. J. SPENCER  
Formerly Keeper of  
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"The author has set a high standard for popular works on scientific subjects. By avoiding technical treatment and using simple language he introduces the reader to the fundamentals of the subject. Well-worn facts are given new lustre and recent discoveries are presented in a manner that is intelligible to the layman. Within the compass of a small, inexpensive book, provided with a good index, is collected considerable information formerly scattered through a voluminous literature, including much that is new to the advanced student."—*Mineralogical Magazine*

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## MEDICINE

# New Recruits Fight Cancer

Tried and proven methods are aided by recently developed chemicals ranging from radioactive gold wash to hormones made by sex glands.

By JANE STAFFORD

(Third of a series of five articles on what can be done about cancer)

► TO CURE cancer, doctors have three tried and proven methods: surgery, X-rays and radium. These make up the old guard in the cancer fight, and they still are the methods by which cancer patients can be and are being cured.

New recruits for the treatment side of the cancer fight range from radioactive gold to hormone chemicals made by the sex glands and even viruses.

With surgery, the abnormal growth, including its extension into surrounding tissues and lymph nodes, is cut out. With X-rays and radium, the nucleus of the cancer cell is damaged and as a result its division and multiplication into more cells is interfered with. Blood vessels in the region of the cancer are also damaged by X-rays and radium. The blood supply and nourishment of the cancer is therefore reduced and this adds damage to the direct injury of the cell.

Radium acts on cancer through the gamma rays it gives off. These rays are of the same nature as X-rays. Consequently scientists often speak of radiation treatment, to cover either or both X-rays and radium's gamma rays.

Some chemicals can be made radioactive in the atomic pile. Among these, the ones important in cancer treatment are cobalt, gold and iodine. Radioactive cobalt gives off the same gamma rays as radium. It is much cheaper and it can be fashioned into various forms, such as needles and fine wire, for effective application to the cancer. Or it can be made into a "bomb" for use at a slight distance from the patient,

somewhat as X-rays are used. It will probably, therefore, be used more and more to replace costly radium.

Radioactive iodine is used for treatment of cancer of the thyroid gland and its use in cancer treatment is limited to this kind of cancer. The reason it is useful in such cancer is that the thyroid gland gathers iodine to use for making its hormone. If radioactive iodine is supplied, the radiation is automatically delivered to the cancerous gland and to thyroid cancer cells that have spread to other parts of the body. Radioactive iodine is still on trial for doctors to learn which patients will be helped and which will not. For many thyroid cancer patients surgery or one of the older forms of radiation will continue to be used until more is known about results with radioactive iodine.

Radioactive gold has been reported to have great usefulness when used as a wash to relieve one of the complications of cancer, the fluid accumulation in the chest or abdomen. Injections of radioactive gold have been tried in cases of prostate gland cancer that were not suitable for operation. And preparation of radioactive gold seeds that can be left in the body permanently gives another promising method of using this material for cancer fighting.

Hormones are used in treatment of cancer of the breast and cancer of the prostate. For the latter condition, female hormone is used. For breast cancer in women before the menopause, male hormone is used. For elderly women and the occasional men breast cancer patients, female hormone is used.

These new recruits to cancer treatment are still very new. Some are still in the experimental stage, some are used as palliative treatment, to give relief of some of the symptoms in patients whose cancers have advanced so far that there is no hope of cure, though life may be prolonged a little, and the patient kept more comfortable.

The old guard methods of fighting cancer, with good hope of curing it in many cases, have also been improved in recent years. Surgeons can operate more effectively because there are now anesthetics easier on the patient, antibiotics to check infection and new knowledge of building the patient's resistance with diet, vitamins and blood transfusions. All of the stomach or all of one lung can be cut out if the size of the cancer makes this necessary.

Radiation treatment has advanced, not only by the addition of radioactive cobalt,

iodine and gold, but also by the development of more powerful X-ray machines. Betatrons and synchrotrons which can operate at hundreds of millions of volts, produce highly penetrating electron beams valuable for treating cancer deep within the body. Rotation of the patient while under X-ray treatment is another new technique for improving results with radiation. One of the problems of radiation treatment has always been that of delivering a cell-killing dose of rays to the cancer without damaging healthy cells in the path of the rays. Improved techniques are overcoming this problem to some extent.

No proved case of cancer is known to have been cured by any unorthodox or secret methods or remedies, though countless sufferers have wished themselves into feeling better for a time after such treatment.

Science News Letter, April 12, 1952

Next Week: Reprieves But No Cures for Most Blood Cancers.



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# • New Machines and Gadgets •

For addresses where you can get more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N ST., Washington 6, D. C. and ask for Gadget Bulletin 617. To receive this Gadget Bulletin without special request each week, remit \$1.50 for one year's subscription.

❁ **OUTDOOR "FLAMELESS"** grill with a stainless steel frame and large working area uses infra-red rays to cook meat. Designed to eliminate drafts, the grill burns charcoal slowly and evenly, thus keeping fats dripping into the fire from flaring up and scorching the meat.

Science News Letter, April 12, 1952

❁ **URANIUM PROSPECTING** outfit of the assemble-it-yourself-in-one-evening type is a sensitive, portable Geiger counter weighing three pounds. Headphone clicks and neon-bulb flashes report gamma and beta radiation of uranium, pitchblende, radium, cosmic and X-rays.

Science News Letter, April 12, 1952

❁ **WING BADGE** for poultry identification is molded of plastic with permanent black numbers or letters which can be read at distances up to 40 feet. The badge slips over the wing and may be fastened with pliers. It is dirt- and weather-resistant.

Science News Letter, April 12, 1952

❁ **TOY ORGAN**, which plays automatically from rolls similar to those used by player pianos, operates on electricity, weighs four pounds and is the size of a table-model radio. Made of plastic, the organ has a range from low-to-middle-to-high C, including sharps and flats.

Science News Letter, April 12, 1952

## Do You Know?

India's population is growing at the rate of 4,000,000 a year.

Chemical control of grasshoppers in Montana and Wyoming alone saved enough pasture grass to produce 11,000,000 pounds of beef.

The human skin consists of two layers, the epidermis, or outer layer of cells, and the dermis or inner layer of cells.

Animal fats and vegetable oils were the common lubricants until the advent of petroleum oil in 1860.

About 100 miles of glass fiber can be spun from a glass marble.

The danger of cold weather, snow or ice is no deterrent to early seeding; on the contrary, alternate freezing and thawing, melting snow or rain help bury the seed.



❁ **PLASTIC SWIMMING** pool for the backyard, lightweight and inexpensive, is shown in the photograph. Measuring 27 by 13 feet with a graduated depth of from three

to five feet, the pool can accommodate 15 persons, and can be covered when not in use. A plastic portable cabana can be used as a dressing room.

Science News Letter, April 12, 1952

❁ **NEW WINDOW SHADES** are made of washable vinyl plastic which will not fray, fade, tear or crack. The opaque gray material resists mildew, oils, flames and most chemicals. Standard-stock shades come in up to 54-inch widths and eight-foot lengths.

Science News Letter, April 12, 1952

❁ **TINY OIL CAN**, which resembles a fountain pen when closed, uses a hypodermic needle for a spout. Oil squirts through the stainless-steel needle point when the plastic oil reservoir is squeezed. Good for oiling those hard-to-get-at places.

Science News Letter, April 12, 1952

❁ **GLASS-BEADED MOVIE** screen is guaranteed to retain its whiteness and high reflective quality for ten years. The screen is washable, flame- and mildew-proof, and suitable for use in any climate.

Science News Letter, April 12, 1952

THE KNOW-HOW TO SHOW . . .

## EXHIBIT TECHNIQUES

Edited by Helen Miles Davis  
112 p., illus., \$2

When it is time to show off a science project in science fair or exhibition, the ideas, hints and experience packed into this comprehensive volume will prove invaluable.

Many exhibits that have won prizes are pictured in photographs and diagrams as helpful suggestions to augment your own original planning and thinking.

What to guard against in laying out your material. How to label, letter and display. Ideas from professional museum preparators. Simple experiments that will be models for those you will incorporate in your project.

How to build a diorama, revolving platform, lighting adapter, models, etc.

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